

National Aeronautics and Space Administration
Commercial Space Committee
of the
NASA Advisory Council

March 1, 2013
Embassy Suites Hotel
Centennial, CO

Meeting Minutes

Thomas W. Rathjen
Executive Secretary
Commercial Space Committee

Patti Grace Smith
Chair
Commercial Space Committee

*Meeting report prepared by
Elizabeth Sheley*

PROCEEDINGS

Call to Order and Opening Remarks	3
ISS Utilization Status and Plans.....	4
Description of NASA’s Agency-level Commercialization Study Plans	8
Committee Discussion and Deliberation	10
Public Input	13
Closing Remarks	13
Adjourn	13
APPENDIX A, ATTENDEES.....	14
APPENDIX B, MEETING AGENDA	145
APPENDIX C, COMMITTEE MEMBERSHIP	16

Proceedings

Members present

Ms. Patti Grace Smith, *Chair*

Dr. Bernard A. Harris, Jr.

Mr. Lon Levin

Mr. Stephen S. Oswald

Ms. Franceska O. Schroeder

Mr. Wilbur C. Trafton

Mr. Thomas W. Rathjen, *Executive Secretary*

Ms. Shawanda Robinson, *Administrative Officer*

Call to Order and Opening Remarks

Mr. Thomas Rathjen, Executive Secretary of the Commercial Space Committee (CSC) of the NASA Advisory Committee (NAC), welcomed those present. He reviewed the agenda, noting that it provided time for public comments at the end of the meeting.

Ms. Patti Grace Smith, Chair of CSC, then welcomed the CSC members. On the previous day, the members visited the Sierra Nevada Corporation, an aerospace company developing a commercial crew space transportation system as part of the Commercial Crew Development (CCDev) program.

CSC plans to bring in two new members: Mr. Joseph Boyle and Mr. Hoyt Davidson.

An Inspector General (IG) investigation is looking at NASA's use of Space Act Agreements (SAAs), raising questions about whether they are being handled appropriately, especially in regard to International Traffic in Arms Regulations (ITAR) procedures and costs.

The Senate will hold hearings this year to obtain an update on commercial space companies and plans, the Commercial Space Launch Act, and commercial aviation versus suborbital space. The last topic is the source of much confusion, in part because Virgin Galactic's plans for suborbital flight have raised issues about jurisdiction, especially for certification. Certification is time-consuming at the Federal Aviation Administration (FAA), so there will be a hearing on that as well. Finally, in preparation for the next NAC meeting, the NAC Chair asked Ms. Grace Smith to have CSC think about whether Committee members might play a role in raising awareness among the new members of Congress.

Ms. Grace Smith announced that Mr. Rathjen was leaving as CSC Executive Secretary. She praised his service to the Committee, thanked him, and noted that the Committee will miss him. Taking over for Mr. Rathjen is Mr. David M. Lengyel, Risk and Knowledge Management Officer for the Human Exploration and Operations Mission Directorate (HEOMD).

International Space Station (ISS) Utilization Status and Plans

Mr. Joel Montalbano, Deputy Manager, International Space Station (ISS) Utilization, and Mr. Brian Harris, Director of Industry/Government Programs, Center for the Advancement of Science in Space (CASIS), discussed the latest activities and plans for utilization of the ISS.

NASA Efforts

Mr. Montalbano explained that ISS is roughly the size of a football field; with livable space approximately that of a five-bedroom home. NASA is one of five major international partners on ISS. The biggest struggles are time differences, language, and competing priorities, but the partners are succeeding. Together, there have been over 100 launches among the international partners. Crew launches now depend on the Russian Soyuz, which carries crew to ISS four times per year. For the next 3 years, there will be about 15 resupply vehicles. Roscosmos, the Russian space agency, has one or two additional research modules that will be added to the ISS.

Mr. Montalbano reviewed some of the research activities on ISS. At this point, the National Institutes of Health (NIH) are not directly doing medical research on the Space Station; such work is being run out of NASA with some NIH input. Mr. Harris added that CASIS does outreach in such situations, and he promised an update.

Mr. Montalbano showed a graph indicating that the number of Research and Technology (R&T) investigations has been increasing over the years among the five international partners. When the partners first built ISS, utilization was secondary to other purposes, but now it is what defines mission success. NASA sponsors the great bulk of the U.S. research conducted on ISS, with the national labs second at about 25 percent. The goal is to expand the national lab portion to about 35 percent. The first CASIS-selected experiments will fly to ISS on Expeditions 37/38.

ISS has about 20 external workstations and payloads. By 2018, NASA expects that all external sites will be full. There are positive aspects to full utilization, but there is also concern that it could be a barrier to additional projects. Therefore, NASA is discussing possible additional external sites.

The internal racks are not full, and rack space is not a limitation. NASA is looking at another “glove box” on the U.S. side for contingencies and to increase capacity; the Agency is also considering adding another express rack or two. By 2014, express rack utilization will be at about 80 percent, and NASA is discussing whether 100 percent is desirable or a barrier. The idea is to eliminate constraints.

ISS has reorganized its program in the direction of utilization of research. For that, it is important to spread resources across the program and make crew responsible for all of the racks. The NASA payload office emphasizes research integration. ISS pays for upgrades, covering launch, maintenance, and hardware costs so that customers can do their science. Mr. Lon Levin expressed concern about how this relates to budget limits.

Crew time and utilization vary, affected by such activities as external work and visiting vehicle arrival. However, preserving 35 hours of utilization per week is a top priority. Mr. Montalbano's team is trying to move bookkeeping of payload rack maintenance over to the maintenance category so that it does not count as utilization, which would then enable greater actual utilization time. Crew time right now is the limiting factor. Commercial space efforts will help address that barrier, since it will enable expanding the crew size to seven.

Another effort involves development of generic guidelines that will enable payloads to fly sooner, within a number of months. This will replace the practice of providing years of "proof on the ground" that a particular experiment is worthy of being flown to ISS. Now, if a mission is good enough and safe to fly, NASA will send it up.

Regarding how experiments are selected, a NASA science forum makes recommendations for missions and a program manager reviews those recommendations. There are peer reviews before a potential mission compliment goes to the program. Dr. Bernard Harris noted that NASA once had commercial centers across the nation to push research, and wondered if those might be revived in order to engage the science community. Mr. Montalbano explained that Principal Investigators (PIs) now run science from their home bases. Mr. Harris added that the commercial center concept disappeared, and there does not appear to be funding for them. The NASA centers fund some research and push Headquarters for funds to do more. Dr. Harris recalled that the science community had been more engaged in ISS, and he saw their involvement as a key to its continuation.

Ms. Grace Smith asked about NASA's approach to filling empty space. Mr. Harris said that CASIS and NASA differ in the way they go about it. NASA's concern is geared toward the elements of exploration, while CASIS is more focused on translational research to accelerate product development.

Mr. Montalbano noted that the lack of funding has significant influence on the use of ISS for research. Strategies to address this include diversification of transportation providers, simplification of integration, and procurement of "upmass" for more users. Mr. Montalbano reviewed some ISS science accomplishments that grew out of NASA's outreach events.

The ISS partnership is happy to have the commercial cargo flights and planned commercial crew efforts. NASA is striving to knock down barriers in hopes of getting more people on ISS and expanding its use as a research platform.

Discussion

Ms. Grace Smith asked if there had been outreach to pharmaceutical companies to test specific products or approaches. Mr. Harris said that he does exactly that, giving the example of targeting certain crystals that benefit from growth in the space environment.

Mr. Levin asked if they were finding that some potential experiments for ISS might exceed the Space Station's life should it not be extended. Mr. Harris explained that this could occur, noting that CASIS focuses on translational research that accelerates product development. In the pharmaceutical industry, a product often takes 10 years from idea to marketplace,

partly because of the Food and Drug Administration (FDA). The timeline to place research projects on ISS has been reduced from 3 years to 9 months, with science projects flying multiple times a year to get the data needed to convince pharmaceutical company management to go forward. He would like to see three to five strong examples of success in this area.

Mr. Levin asked if any thought had been given to manufacturing in space. Mr. Harris replied that the focus is on experiment acceleration. He was not sure that ISS is right for production, though the Bigelow Aerospace concept might be.

Mr. Montalbano did not have the specific level of research funding at hand but promised to provide that number. He noted that that a Robotic Refueling Mission (RRM) had recently been conducted on the ISS, and that other work on the Space Station involved communications and navigation testing, along with materials experiments. The team is constantly looking at how to work with smaller hardware and greater efficiency. Other areas of research on ISS include life support systems and fire safety. After reviewing current, planned, and proposed ISS technology demonstrations, Mr. Montalbano explained that one way to measure success is through publications, and almost 800 scientific publications have involved ISS. There have also been patents.

In answer to a question about the breakdown of hours during the astronauts' work-week time breaks down, Mr. Montalbano replied that there are 8.5 hours of daily "physical time," encompassing 6 scheduled hours plus 2 to 2.5 hours for exercise. These 8.5 hours do not include meals, site support time, activities related to waking up, etc. The 1-year expedition starting in 2015 will include studies on human safety and health in space, and will look at bone mass and other concerns.

Regarding patents, Mr. Harris referred to research that resulted in a patentable product and a new company. Mr. Levin asked if the research could have been done on Earth. He thought that some experiments are ISS-specific, and it would benefit the program to identify those things that must have the ISS in order to proceed. When Dr. Harris added that he sees ISS as a platform for discovery, Mr. Levin replied that his concern is that ISS research is very expensive and needs to be justified, as will the eventual successor to the ISS. People will challenge the value of this work unless they see that ISS is necessary, so NASA should identify what is specific to ISS, what is helped by ISS, etc. Dr. Harris saw benefit to stating that a successful experiment was done in space. The idea of ISS as a national lab is that it is a resource enabling people on Earth to use space as an environment. This is a great selling point.

Ms. Grace Smith asked Mr. Harris how he thought those who are pushing for the extension of ISS should be thinking. He replied that the space national lab should be no different from a national lab on Earth. If scientists believe they can get funding to prove something in space, and it has value, that is the benefit. If someone wanted to look at research done only in space versus knowledge gained in space, they could put together a compelling story. Mr. Harris added that CASIS does put together that information. There are products that can

only be developed due to ISS involvement. CASIS picks its targets to tell that story, facilitates and seeds the research, and makes it as painless as possible.

Mr. Montalbano reviewed some additional research activities on ISS, such as testing technology. He showed how an ISS application was later used to filter water in communities after an earthquake. Another example was the testing of a bone mass drug on mice, which provided the information the researchers needed to move ahead with the drug. The development of a robotic arm for the ISS led to the creation of a device to assist in difficult neurosurgeries. Ms. Grace Smith observed that it is important to promote these patents and achievements to the public so that people know what NASA is doing. Mr. Harris said that this is part of the CASIS mission, to advocate for ISS. There are some people, including some scientists, who should know what NASA is doing but do not. There is a lot of work to do with communications.

Mr. Stephen Oswald said that the bone mass study is not new, but no one hears about it. NASA and FAA cannot advertise their accomplishments, and the companies that benefit from this research do not advertise NASA involvement. Finding a way to get the companies' help would aid in breaking the cycle of continually going to Congress. Corporations will not do anything unless it helps their bottom line, however, while private individuals are different. Ms. Grace Smith disagreed, stating that she has some examples of corporations spreading the message.

Ms. Francesca Schroeder asked what opportunity NASA might have to talk to Amgen, the pharmaceutical company involved in the bone mass research, about mentioning the Agency in its many advertisements. Mr. Harris said that Amgen sold the intellectual property rights, but Ms. Schroeder made a good point. CASIS developed a new concept called "Made in Space," a branding effort to help accelerate the messaging. Ms. Schroeder suggested that there should be some kind of agreement with the relevant pharmaceutical companies to mention when their drugs originated or were tested on ISS. This need not be a formal agreement or quid pro quo. Mr. Levin added that a missing piece is that there are advocacy groups that do this, which should be explored.

Mr. Oswald asked about the plan to extend ISS, noting that the sooner the decision is made, the better. He was specifically concerned about which entity is driving the decision and the process of getting to the extension. Mr. Montalbano replied that NASA has strategic panels meeting to build that story and the Agency is in the process of pulling it together, with some actions already identified. He believed that NASA would be able to move soon. Mr. Oswald noted that although another NAC committee is focused on that, CSC should be, too.

Mr. Trafton added that NASA has to justify the existence of ISS with a budget presented to Congress. He found it frustrating that the world does not know about some of the great things to come from ISS. For example, he has seen the neurosurgery assisted device on television without anyone mentioning that it involved NASA. Ms. Grace Smith thought there should be a Congressional hearing on this topic. Many members of Congress are not familiar with ISS's achievements. Mr. Oswald suggested having NIH and the National Science Foundation (NSF) involved in making this point.

CASIS Efforts –

Mr. Harris explained that the cooperative agreement CASIS has with NASA is for \$15 million per year for 10 years. Of that annual allocation, \$3 million must be given out as grants, leaving \$12 million per year for other purposes. The concept is that CASIS, which began operating in 2011, would be funded solely by the Federal government for the first 3 years, while setting up a membership organization with corporate members that can benefit from the ISS, as well as nonprofits. There are currently 25 Full-Time Equivalents (FTEs) and some consultants working for CASIS.

Mr. Harris used Amyotrophic Lateral Sclerosis (ALS, also known as Lou Gehrig's disease) as an example of a disease with an active nonprofit group that could be interested in space-based research. Some “disease groups” are concerned about branding, but most focus on patient care. There should be an effort to find those organizations that have not made significant progress towards a cure or treatment terrestrially. CASIS can do fundraising with these groups outside of its budget.

Mr. Harris explained the work and outreach that CASIS is doing in the health field. Commercial organizations care about the end product, but CASIS helps ease the process by reducing barriers such as paperwork. The organization is working on some lingering concerns regarding intellectual property. Still, the cycles are long, requiring patience. CASIS has to find the right companies.

A rough timeline for getting a project from initial discussions to placement on ISS is about 2 years. CASIS has funded some grants in areas such as stem cell research and materials science, and is now generating even more interest from the science community. Most of the CASIS directors are from academia, but some are from business, including a biotech entrepreneur. The directors guide the research portfolio and focus areas, and target companies that can benefit. Ms. Grace Smith proposed that CSC compile ideas and suggestions to forward to Mr. Harris.

Mr. Oswald asked whether a program exists to address ISS upgrades. Mr. Montalbano replied that the international team is always looking at upgrades, giving some examples of recent and planned upgrades. The team is always asking the community what they need.

Mr. Levin stated that both Mr. Montalbano and Mr. Harris answered the Committee's questions very well. He was very impressed and wanted his praise on the record. Mr. Rathjen thanked them as well. Mr. Montalbano said that he would get back to CSC with specific answers to any questions he was unable to address at the meeting.

Description of NASA's Agency-level Commercialization Study Plans

Dr. Rebecca Spyke-Keiser, Associate Deputy Administrator for Strategy and Policy, explained that her office does long-term strategic planning for the Agency. One of the avenues for partnership is commercial space, so NASA sponsored a study of commercial space partnerships. The goal of the study was to “provide recommendations for fostering

and incentivizing commercial space partnerships between NASA and private commercial organizations that will enable NASA to meet its mission objectives in an efficient and innovative manner as well as strengthen US global competitiveness and promote the economic vitality of the nation.” The study began in September 2012, to be completed in spring of 2013. Dr. Spyke-Keiser hoped to bring the results to CSC.

The study approach involved the following actions:

- Assess which NASA mission areas have potential to result in economic benefit if the commercial partnership approach is selected;
- Assess current methods through which NASA develops and implements commercial space partnerships; and
- Analyze prioritized mission areas for potential economic impact and mission alignment to NASA.

The study was being done by an internal NASA team with representation across the centers and more than 50 participants. Areas of interest include economic impact, economic development, dual-use technology development, and others. At the mid-point of the study, the team had identified a need for integration across areas of interest and was looking at developing a set of recommendations for NASA to either study further or implement.

Dr. Spyke-Keiser explained that the Economic Assessment Framework (EAF) tool aided in evaluating the different options for stimulating commercial partnerships for economic benefit, using six core economic vectors: market, labor, capital, productivity, technology, export, and timeframe. She gave an example of how the EAF was applied. The study identified the following areas for further examination:

- Space communications;
- Earth observation;
- Satellite in-space servicing;
- Cargo transport for beyond Earth orbit;
- Interplanetary small satellites;
- Robotic mining technologies;
- Micro-gravity applications for pharmaceuticals and biotechnology;
- Advanced liquid-fuel engines; and,
- Internal process methods for enabling commercial partnerships.

The hope is that the study will result in process recommendations to help better enable commercial space partnerships, and that the analysis will both support NASA objectives and stimulate the creation of new markets.

Dr. Spyke-Keiser gave an example of what the team was targeting on internal processes, noting that when the centers or programs want to pursue commercial space partnerships, they often do not know where to bill, as NASA has no billing code for this. One action resulting from that might be to create a billing code for commercial space, which would show both that NASA is encouraging it and that NASA personnel can spend time pursuing

it. NASA needs to look at how to bring commercial partnering into the NASA process from the beginning rather than as an afterthought.

The team members are center employees, brought in via recommendations from center directors. Dr. Spyke-Keiser said that she would provide CSC with information about the team composition. Dr. Harris suggested that an Agency-wide effort would help the Centers come to grips with commercialization. Dr. Spyke-Keiser agreed. This is a culture change, beyond pursuing actions. The Agency has a great incentive to partner in a new way, giving up some control at NASA and letting companies take more of a lead. There is still an internal struggle at NASA on this, but she feels people are shifting.

Ms. Grace Smith said that she looked forward to a follow-up, and thanked Dr. Spyke-Keiser for her presentation.

Committee Discussion and Deliberation

Findings and Recommendations

Ms. Schroeder presented the first of two draft recommendations to be considered, CSC-2013-R6, Space Act Agreement (SAA) Internal Coordination. This was a revision of an earlier recommendation, the goal of which was to improve the process of getting SAA's through the Agency review and approval process. There was a question about whether to proceed with the recommendation or wait for the results of the IG investigation on SAAs. Mr. Levin added that as they asked Headquarters and center personnel about the bottleneck, it became clear that NASA should have people charged with ensuring that the difficult SAAs get done. They concluded that the best way to approach this was to have a person responsible at Headquarters, a soft deadline, and at least one person with authority to interact with the commercial partner. These are simple steps that need to be stated.

In discussion, the general sentiment was that CSC should move ahead with the recommendation instead of waiting for the IG investigation. Mr. Levin said that CSC has done a lot of work on this issue, and the recommendation addressed the common theme of the tension between the centers and Headquarters. Mr. Oswald added that while there were never any clear criteria for how SAAs were to be chosen to go to Headquarters for approval, the Headquarters view was that when they needed more information from the centers, the centers were slow to respond. Simple deadlines for that situation would be helpful. He did not have the impression that NASA was enforcing its own rules, and wondered if there might be a need for a better process.

Mr. Trafton observed that there was no central point of entry at Headquarters for commercial, and Ms. Grace Smith said CSC is really recommending a structure to help industry. Mr. Levin added that the lack of a NASA timeframe or deadline had to frustrate commercial people. A timeframe would help industry understand the process, and it might increase the use of SAAs on controversial items.

With a small editing change, the recommendation was approved to go to the April 2013 meeting of the NAC.

The second recommendation, CSC-2013-R6A, addressed the fact that NASA does not use Cooperative Research and Development Agreements (CRADAs) to the same extent as other Federal agencies. Ms. Schroeder explained that CRADAs are designed to protect other parties' intellectual property, an issue that had been raised earlier by Mr. Harris in regard to CASIS. CSC thought it would be worth asking NASA to review whether CRADAs could be useful alternatives to some of the Agency's current contract mechanisms. The recommendation did not ask that CRADAs be used more, just that their use be evaluated. There are a number of reasons why NASA might not employ them at present. For example, there might be a resources issue, NASA might not have a person to apply to this, or the Agency might be more accustomed to relying on SAAs.

In the course of revising the draft recommendation, CSC removed the word "greater" throughout. There was also discussion about whether to refer to NASA's use of SAAs or leave it out. Ms. Schroeder said that the point was to have NASA remember that CRADAs are available and can be used with commercial partners.

Ms. Grace Smith said that she would take the edited recommendation to the full NAC in the spring.

Mr. Oswald and Dr. Harris agreed to develop a draft finding on the commercial use of ISS, which will state that the ISS Program and CASIS are using the appropriate means of engaging commercial industry in ISS utilization opportunities. Also, Mr. Harris proposed drafting a finding that the structure of the commercial partnership study described by Dr. Spyke Kaiser will go a long way to support culture change at NASA. Mr. Rathjen said that he wanted to see the make-up of the Commercial Space Partnerships Study team, as there could be a recommendation coming out of that if there was not enough industry involvement. Ms. Grace Smith hoped to take a finding to NAC stating that CSC liked and supported what NASA was doing here.

Mr. Oswald asked if the Committee should consider a finding that the timeliness of the decision to extend the ISS is critical to the success of commercial crew efforts. Ms. Grace Smith agreed that that was important. Mr. Oswald continued by saying that if CSC is supposed to advise NASA, they ought to put forth a recommendation to ensure this extension soon, as that would be better than waiting to the eleventh hour. Mr. Rathjen agreed, noting that this is a top near-term priority for Mr. Bill Gerstenmaier, Associate Administrator Human Exploration and Operations. Mr. Rathjen advised asking Mr. Gerstenmaier if the proposed recommendation would help or hinder his strategy to address the issue. Mr. Oswald agreed, adding that he believed it was important to start these discussions with key people in Congress right away, showing the progress and where it is going, noting the national prestige, and so forth. However, it is hard to push Congress.

General Discussion

Ms. Grace Smith said that new members of Congress often do not know what is going on with NASA, yet some of them end up on the oversight committees and focus on cost because they lack context. CSC needs to follow through as subject matter experts to help communicate with Congress on these topics.

Ms. Grace Smith also wanted to add to the feedback to Mr. Harris that CASIS could use associations and nonprofits to provide adjunct staffing, and have their constituents make the case with Congress. That led her to think about CSC's next meeting, when the Committee members could arrange to speak with a few of the newer Congressional members and staffers. She thought that as Federal Advisory Committee Act (FACA) temporary employees, CSC members are allowed to do this as long as they do not sell an active NASA proposal, though she wanted to verify that. Mr. Rathjen said that he would consult with NASA's Office of General Counsel and Office of Legislative and Intergovernmental Affairs.

Mr. Oswald noted that on Capitol Hill, visitors spend a lot of time explaining their product. He suggested developing four to six charts, to be reviewed by OLIA, Mr. Gerstenmaier, and others. Ms. Grace Smith agreed, adding that this would probably not happen for several months, but it was good to think ahead.

Related to outreach, Mr. Levin explained that there are nonprofit associations that promote space-related interests. He suggested that CSC talk to several of them about what they do and their messages. Mr. Oswald suggested putting together a list of such groups.

Regarding facilities, it was observed that this issue keeps coming up, as with the excess capacity at Kennedy Space Center (KSC). Mr. Lengyel took an action to seek further information and input from the appropriate individuals at NASA Headquarters. Ms. Grace Smith pointed out that the Senate is still undecided as to where to place the weather function that exists inside of the Department of Commerce, but that may be dealt with soon.

Mr. Oswald said that there is an effort to put hosted payloads on the hyper-spectral imager, with much interest in Japan but almost none in the United States. He wondered if there was a way to move this along, and was concerned that there might be a government barrier that CSC should address. He knows the people involved, and they have data, so CSC might be able to use this as an example of what is broken and how to fix it. CSC might want to have an offline discussion briefing on this.

Regarding inconsistency among the centers in their approaches to commercial space, Mr. Rathjen explained that this was submitted to the NAC as a finding, citing KSC as having the best practices. Dr. Harris suggested listing the best practices, possibly as part of the Commercial Space Partnerships Study, with reference to it in the recommendation addressing the study.

Ms. Grace Smith asked if there were any interest in having follow-up briefings with companies, which CSC had not done for a couple of years. Mr. Levin suggested calling in a

pharmaceutical company that has used ISS, just to get more information about their process. Ms. Grace Smith recommended also asking for input from NSF and NIH.

Public Input

Ms. Donna Packard, a systems engineer with Stellar, asked if there had been any analysis done to show that ISS is a good financial asset. An analysis should be able to capture the medical costs that have been driven down through ISS-supported research. If the drug companies could share their data on people who use a given drug, that ought to be quantifiable, even to Medicare and Medicaid. Mr. Montalbano said that his group can look at that. The brain surgery outcome is a clear example of ISS research that saves money and lives. Ms. Packard agreed, adding that the general public and legislators do not understand that in the end, ISS is financially sustainable.

Mr. Larry Richardson, with the business development section of ULA, raised the issue of commercial success stories and NASA's inability to share in the companies' profits. His experience was that the Treasury Department could not find a way to get this money back into the Federal system to the ISS. Congress took up the issue at one point but did not follow through despite a desire to get commercial funds back to NASA. Mr. Richardson suggested that CSC address this, adding that the situation may have changed since he was last involved. Dr. Harris said that it always comes back to the Federal rule that any money received has to go into the general fund. Mr. Rathjen said that the reimbursable SAAs have been a solution to this the problem, though in a fairly confined context.

Mr. Levin explained that if a transaction cost is involved, that can be paid directly, but there is a prohibition against making money off the public. Mr. Richardson added that when he was involved with this issue, the pushback was that the budget would be cut by a comparable amount. It was challenging. Ms. Schroeder said that this needs more discussion, and she would like CSC to have a briefing on it by a corporate financial officer. Her experience is that it is easy to pick up funds through a fee, but she would like a more formal discussion.

Closing Comments

Ms. Grace Smith thanked the presenters. She looked forward to going to the NAC with some of this. She also thanked Mr. Rathjen, Mr. Lengyel, and Ms. Shawanda Robinson. Mr. Rathjen thanked everyone and said that although he was moving into a great career opportunity at the Agency, he would miss CSC.

Adjourn

The meeting adjourned at 11:26 a.m.

Appendix A, Attendees

Committee Members

Ms. Patti Grace Smith, Chair
Dr. Bernard A. Harris, Jr.
Mr. Lon Levin
Mr. Stephen S. Oswald
Ms. Franceska O. Schroeder
Mr. Wilbur C. Trafton
Mr. Thomas W. Rathjen, Executive Secretary
Ms. Shawanda Robinson, Administrative Officer

NASA Attendees

David Lengyel
Joel Montalbano
Rebecca Spyke-Keiser

Non-NASA Attendees

Brian Harris, CASIS
Kevin Miller, Ball Aerospace
Donna Packard, Stellar
Larry Richardson, ULA
Elizabeth Sheley, Zantech
Mark Vozoff, nu2space

WebEx

Dennis Clay
Kevin Fagedes
David Gump
Alan Keisner
Rachel Kraft
Mary MacLaughlin
Michael Palinkas
Nigel Simmons
Janice Smith
Rebecca Spyke-Keiser

Appendix B, Meeting Agenda

8:00 a.m.	Opening Comments
8:05	ISS Utilization Status and Plans
9:35	Description of NASA's Agency-level Commercialization Study Plans
10:05	Break
10:15	Committee Discussion and Deliberation
11:15	Public Comments
11:20	Closing Remarks
11:30	Adjourn

Appendix C, Committee Membership

Ms. Patti Grace Smith, Chair
Patti Grace Smith Consulting

Mr. Thomas W. Rathjen, Executive Secretary
NASA Headquarters

Dr. Bernard Harris
CEO, Vasalius Ventures

Mr. Lon Levin
Co-founder, XM Satellite Radio and other satellite businesses

Mr. Stephen S. Oswald
Founder and President, Syzygy Enterprises, LLC

Ms. Franceska O. Schroeder
Principal Attorney, Fish & Richardson

Mr. Wilbur C. Trafton
President, Will Trafton and Associates